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Montana Conservation Districts

2000 Project Posters

A collection of natural resource conservation efforts by Montana's conservation districts

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Conservation districts 2000 project posters

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Lewis and Clark Conservation District
Liberty County Conservation District
Lower Musselshell Conservation District
Meagher County Conservation District
Missoula County Conservation District
Missoula County Conservation District
Park Conservation District
Park Conservation District
Phillips Conservation District
Pondera County Conservation District
Prairie County Conservation District
Richland County Conservation District
Rosebud Conservation District
Sweet Grass County Conservation District
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Toole County Conservation District
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Celebrating Fifty Years of Service to Beaverhead County

Chairman Art Christensen (left) and Vice-Chairman Emmett Blomquist (right) have served the Beaverhead Conservation District since its inception in 1950.

Supervisors, Beaverhead Soil Conservation District, 1950

Beaverhead Conservation District

406-683-6539

Spring development

(Inset photo, above right) Harold and Margie Peterson survey spring development

THE BIG HOLE WATERSHED PROJECT

Keeping rare fluvial arctic grayling off the endangered species list was a common goal for many agencies, private individuals, and landowners who worked together to establish off-river alternative watering facilities in the upper Big Hole basin. The project successfully developed 13 stockwater wells and two springs, decreasing the need to divert water for stock. Water is pumped from the wells into the river during low water and drought conditions on the Big Hole River. The aquatic environment is enhanced by maintaining instream flows, thus providing sufficient habitat and suitable water temperatures for the river's trout and grayling fisheries. "*This is the most positive project we've done in a long time,*" said Chairman Art Christensen.

Large capacity stockwater tanks

Tour of the stockwater well program

Routine monitoring and well check

Mobile solar panel for pump operation

CHALLENGE OF CHANGE—
A Field Day on the Sun River

The Cascade County Conservation District Board of Supervisors worked with the Lewis and Clark Conservation District, the Teton County Conservation District, and the Sun River Watershed Group to host a tour of the Sun River Watershed Project.

Cascade County Conservation District

406-727-3603

One hundred and twenty-eight people attended the Sun River Watershed Project tour. Shirley Gammon, the state conservationist for the U.S. Natural Resources Conservation Service (NRCS), opened the tour with her comments. Plaques were presented to Greenfields Irrigation District and Fort Shaw Irrigation District in recognition of their dedication and commitment to efforts in the watershed.

Cascade County Conservation District's Ken Lemenager and U.S. Natural Resources Conservation Service State Conservationist, Shirley Gammon, work together to strengthen the partnership.

Landowners play a key role.

Tour participants cross Elk Creek for a view of the Scherrer project.

Touring the bank stabilization project on the main stem of the Sun River—300 feet of riprap work.

Three buses followed by private vehicles proceeded on the tour. The first stop was at Thompson's Sand and Gravel, situated on the main stem of the Sun River. The group toured a large bank stabilization project that used cottonwood rootwads keyed into the bank. The tour group proceeded to the banks of Muddy Creek. Once a truly muddy creek, Muddy Creek supports a fishery in Cascade County.

Muddy Creek project: 500 barbs and 13 drops installed. Erosion has been reduced by approximately 75 percent. Vegetation is coming back and the fishery has been restored.

The next stop was in Teton County Conservation District at Marc Lee's bank project. Christmas trees were bound together as bank revetment. Chris Ostberg of Teton County Conservation District addressed the group during a luncheon hosted by parents of Eager Eagles 4-H Exchange Club at the Fairfield Community Hall.

Sun River Watershed Coordinator, Allan Rollo, explains the Sun River watershed project.

The group proceeded to Fred Scherrer's ranch near Augusta, in Lewis and Clark County. Elk Creek is also known as the South Fork of the Sun River. The riparian recovery project involved a section of Elk Creek adjacent to a hay field. It had been completed only a few months before the tour. The constructed area, with willows sprigged into the banks, should allow the riparian area to recover. Funding for this project was provided by grants in kind contributions from three conservation districts, and in kind support from the U.S. Forest Service, the Montana Department of Fish, Wildlife and Parks, and the U.S. Natural Resources Conservation Service.

This workshop and tour are the result of cooperation, coordination, commitment, and hard work on the part of a great many individuals, agencies, and organizations. Landowners cooperated, and we had the help of Warren Kellogg, Tom Peck, Allen McNeal, Sue McNeal, and the Sun River Watershed Coordinator, Allan Rollo.

PROJECT LOCATION

The Sun River Watershed is located in west-central Montana and covers 2,200 square miles (1,408,000 acres), as follows:

- **356 square miles (228,096 acres) northwestern Cascade County**
- **1,089 square miles (696,960 acres) in eastern Lewis and Clark County**
- **755 square miles (482,944 acres) in southern Teton County (approximate figures only)**

The project includes:

- **U.S. Forest Service wilderness**
- **critical wildlife winter habitat**
- **several small communities**
- **rangeland**
- **irrigated cropland**

PROJECT OBJECTIVES

The project objectives of local groups are as follows:

- **maintain and/or improve a viable agricultural economy**
- **control noxious weed infestations in the Sun River Watershed**
- **reduce the sediment loads into the Sun and Missouri Rivers**
- **improve the overall water quality of the Sun River**
- **improve the flows in the Sun River**
- **improve the fisheries of the Sun River**
- **ensure effective subdivision planning**

The Sun River begins in the Bob Marshall Wilderness area and flows for approximately 110 miles as it meanders out of the mountains through rolling, grass-covered foothills and farmland, contributing its water to various uses until it mingles with the nation's second largest river, the Missouri, at its confluence near the historic city of Great Falls. As it makes this trip, it also passes the communities of Augusta, Simms, Fort Shaw, Sun River, Vaughn, and Sun Prairie Village.

Rocky Mountain front on the Sun River.

TOPOGRAPHY AND GEOLOGY

The Sun River is a major tributary of the Missouri River located in north-central Montana. The basin is about 110 miles long and 30 miles wide. It drains 2,200 square miles of the east slope of the Rocky Mountains. Elevations range from 9,000 feet to 3,390 feet.

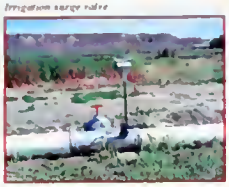
Cascade County Conservation District supervisors were all on hand to host landowners and supervisors from other conservation districts.

The watershed tour provided an arena for serious discussion about stream environments and total maximum daily loads (TMDLs).

STAKEHOLDER REPRESENTATION

Teamwork is the driving force behind the success of this project. A partnership coordinates the needs of the project. Key decisions and direction are formulated during quarterly group meetings. Day-to-day operations are led by three conservation districts, calling special work group meetings. Opinions are integrated by the watershed coordinators at their respective board meetings. A consensus process is used to reach an agreement with all partners.

The respective irrigation and conservation districts work cooperatively on behalf of the major land users who are agricultural. Numerous conservation groups and many businesses contribute funds, time, and ideas to the project. More than 20 local, state, and federal government agencies actively participate, providing guidance and suggestions. All participants have a voice. Work groups encourage teamwork and provide general direction for cooperative efforts low and achieving the objectives of this plan. Actions from these groups are voluntary.



IRRIGATION EFFICIENCY

The district is involved with local workgroup activities with the Buffalo Rapids Irrigation District. The workgroup's goals and objectives are to increase water management efficiency to 50 percent on the project area. Irrigation water management and installation of buried pipe, gated pipe, are being used on the project to meet these goals.

Custer County Conservation District

406-232-7905

WINTER GRAZING SEMINAR

The Custer County Conservation District co-hosted the 2000 Winter Grazing Seminar with Prairie County Conservation District.

A record number of participants came from three states and Canada to take in this year's seminar. Topics for this year's seminar ranged from increasing profitability to grazing alternative crops and raising buffalo.

2000 WINTER GRAZING SEMINAR
Miles City • Montana

CONSERVATION KIDS' DAY

One hundred and ten Custer County rural school students and 10 Prairie County sixth graders attended this year's Conservation Kids' Day. Stations for the event ranged from soils and local archaeology to identifying aquatic insects and fish. A barbecue lunch was provided, sponsored by both conservation districts and the Seedex Seed Company. The event concluded with a Cavalry/Civil War presentation.

The primary goal of the Custer County Conservation District is to improve range management in Custer County.

The Custer County Conservation District sponsors a variety of opportunities to improve range management in Custer County, including:

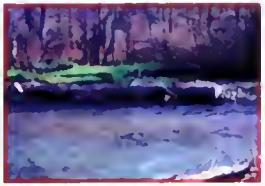
- Rangeland Improvement Loans
- USDA cost-share programs to assist landowners with rangeland management and range improvements

SWIFT CREEK REHABILITATION

Flathead Conservation District

406-752-4220

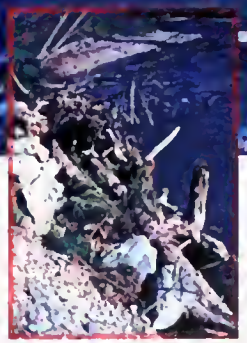
Steve Bulkley of Watershed Consulting, the design engineering firm, stoops to point out the tree rootwads that have been buried in the streambank. Young plants are interspersed along the bank.



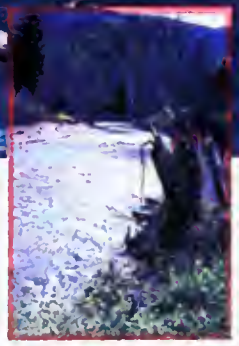
In one stretch, a downed tree was cabled to the bank to redirect the flood flows back into the main channel. Vegetation has been planted on the far side of the log to further stabilize the bank, particularly as the log decomposes.

Note the "natural" look of the stream stabilization project. This approach adequately addresses the erosion of the streambank while avoiding the solid rock wall look of a "hard fix" armoring. The "soft fix" creates better fish habitat than solid rock.

Combining tree rootwads and medium-sized boulders into the actual streambank creates a stability that rock facing could not duplicate. Note the sod strategically placed on top of the armoring.



Rootwads and rock are built from a level beneath the channel floor. Logs are laid parallel to the bank and stabilized with rock. Sod and bushes are placed in the spaces between the logs. Whole bushes with root balls attached are lifted from adjoining riparian areas and planted along the banks.



Large tree rootwads are actually excavated into the bank, duplicating nature's landscape. Large rocks are hidden below vegetation, making the project more appealing to the eye.

Flathead Conservation District administers Montana's Natural Streambed and Land Preservation Act (the "310" law) on 600 perennial (year-round) streams within Flathead County. The projects range from small culverts to major renovations. An example of a recent rehabilitation was that undertaken by four landowners along the mouth of Swift Creek, within the jurisdiction of the 310 law.

Seventy-two streams contribute to Swift Creek as it winds its way from the divide to Whitefish Lake in northwestern Montana, creating a raging stream during spring runoff. The lower portion of the creek just upstream of the lake was severely eroding. Many bank stabilization projects had been tried there unsuccessfully over the years. The accelerated bank erosion threatened homes and a county road.

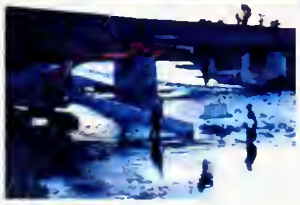
Watershed Consulting of Whitefish designed the "soft fix" rehabilitation for the landowners, utilizing tree rootwads, downed trees, rock placements, and heavy revegetation. This approach was an alternative to the standard rocking of the stream. These photos show the ongoing success of the project one year later.

A front-end loader sets the diversion, typically built as a wing dam. Excess flows go around the upstream end of the diversion rather than overtopping the blocks

CONCRETE BLOCK IRRIGATION DIVERSIONS

Gallatin Conservation District

406-587-6929



ADVANTAGES

- Installation and removal and fast and easy.
- Local farm equipment can he used to install the diverstion.
- The concrete blocks last for many years.
- Long-term maintenance of the diversion site is reduced.
- Safety hazards and interference to recreational floaters are minimized.
- Fish passage is allowed around the structure.
- If the stream moves, the blocks can he moved to a new position.

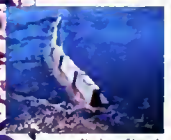
DISADVANTAGES

- An area on the streambank adjacent to the diversion is reequired to sture the blocks.
- Block diversion is designed to be removed in the fall after the irrigation season.

A chain is hooked onto exposed rebar at the top of the block for lifting. The blocks are set on the streambed after spring runoff, after the stream has freely flushed gravel bed load and debris through the diversion site

Tom Hughes, from the Montana Department of Natural Resources and Conservation, developed a new irrigation diversion system using portable concrete blocks. The diversions were designed to provide an environmentally friendly alternative to the traditional diversion methods of constructing permanent dams with large rocks and constructing temporary dams with river gravel. Concrete blocks are relatively inexpensive and durable, and they can be rapidly placed in the streambed.

A 223 grant was acquired in 1997 by Gallatin Conservation District to provide assistance to construct two steel forms capable of building a wide variety of concrete block sizes. The 223 grant was also used to install the first block diversion on the Nichols-Burrell Ditch in Logan. Fifteen blocks were placed with an excavator. Each 2-foot by 6-foot block weighs approximately 2,000 pounds.



Baker Ditch

Baker Ditch

Roadarmel Ditch

Mammoth Ditch

The Gallatin Conservation District applied for a second grant in 2000 to place three additional structures in the Gallatin valley: on Baker Ditch, Roadarmel Ditch, and at Mammoth Ditch Company on the Gallatin River. The latter required 18 blocks for diversion of the water into the head of the irrigation ditch.

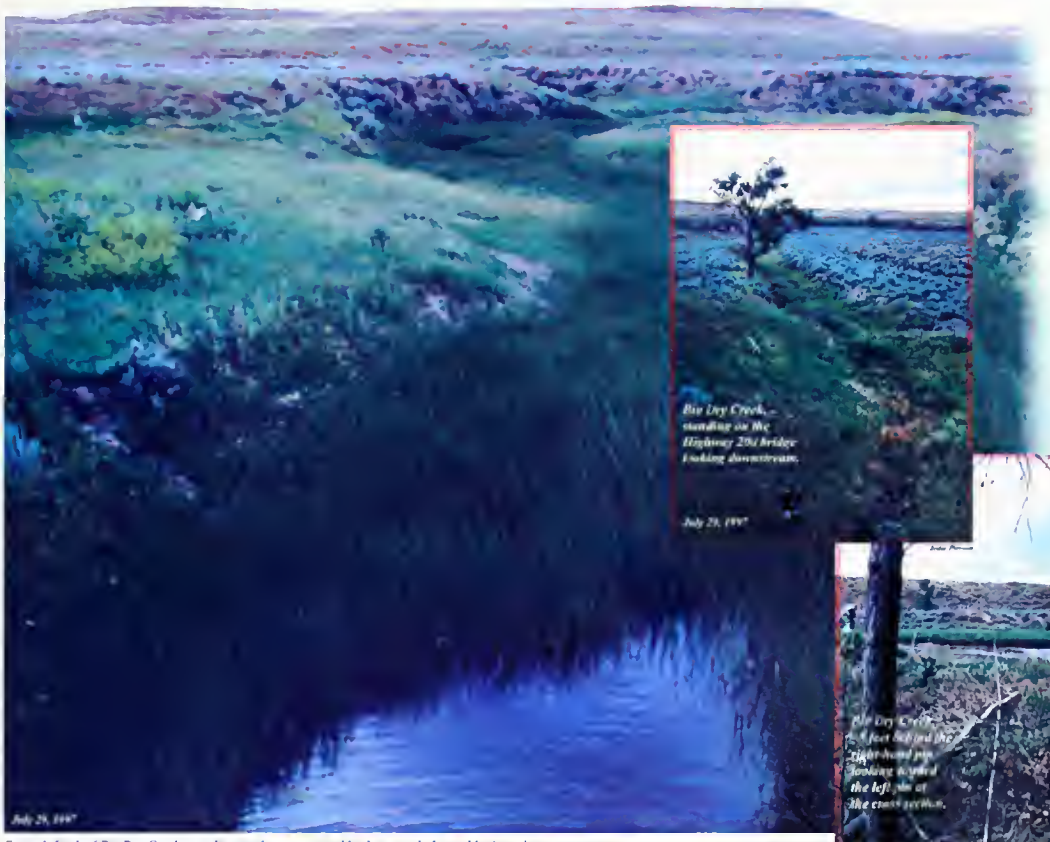
Governor's Range Tour, July 8, 1999 — Little Dry Creek at A. Hafla's.

Standing over pin facing South — Big Dry Creek above Jordan (at Cottonwoods).

STREAM MONITORING PROJECT

Garfield County Conservation District

406-557-2232



Steven's Fork of Big Dry Creek, standing on the county road bridge at mid-channel looking downstream.

In 1997 Garfield County Conservation District began a stream monitoring project on the streams in the county that had been listed as impaired. Big Dry Creek and Little Dry Creek were the first streams targeted. Warren Kellogg and Bob Bukantis assisted with assessments and implementation of the monitoring plan.

Different sites were targeted along each stream. At each site, photo points were established, and a cross section of the creek bank was surveyed. Electrical conductivity, salinity, water temperature, and flow were measured. Grab samples taken at each site were tested for nutrients, nitrates, phosphorus, common ions, and suspended solids. Algae and bug samples were also gathered and tested

With assessments complete, monitoring sites were established along Big Dry Creek and Little Dry Creek. Monthly monitoring began late in the summer of 1997. Monitoring continued on a monthly basis, except during freezing, through spring 2000, at which time bimonthly monitoring commenced. Once every three years, photos will be taken at established sites on both creeks. A cross section for each will be completed in addition to the tests listed above

Initial assessments will be completed and new monitoring sites are scheduled for establishment on Calf Creek and on the South Fork of Lodge Pole Creek during the summer of 2000. Streams will be monitored monthly for the duration of funding or until sufficient data are collected

RESULTS AND CONTINUED ACTIVITY

After the initial assessment, Little Dry Creek was removed from the impaired stream list. Big Dry Creek, Calf Creek, and the South Fork of Lodge Pole Creek are still listed as impaired. Efforts continue to secure data to assist in the removal of these creeks from the impaired stream list

Funded by the HB 223 grant program of the Department of Natural Resources and Conservation

HUTTERITE COLONY SCIENCE DAY

Four colonies – Hillside and Rimrock Colonies of Toole County, Sage Creek Colony of Liberty County, and Glendale Colony of Glacier County – attended Science Day 1999

Jane Halger, MSCA, explained to students and teachers how to identify and recharge saline areas.

Joe Don Stein, MSCA, explained the planting process for the medium to high salt-tolerant Shoshone beardless wildrye and Garrison creeping foxtail plugs from Montana State Nursery.

"Farm Game" – a portable groundwater flow model, was used to demonstrate water flow patterns and potential contamination issues. The game illustrates monitoring wells used in saline groundwater investigation.

Students learned soil types and textures, soil moisture, water quality issues, planting plugs, and monitoring salt hazard/nitrate levels. Students sampled and measured electrical conductivity and nitrate levels in groundwater

Glacier County Conservation District

406-873-5752

Robert Legare tells how the monitoring well was drilled and how samples are withdrawn and analyzed.

The long-term goal of Science Day is to promote natural resources conservation by building a trust level with natural resource personnel and familiarity with programs, groups, and agencies. This trust level will also encourage colony residents to support actions by Colony Farm Bosses to continue natural resources protection.

Hutterite Colony classroom resources are limited, and one or two teachers instruct multiple grades. The Science Day project facilitated incorporating agricultural issues relative to colony situations into the science natural resources education.

Education grants were obtained by Glacier and Liberty Conservation Districts to co-sponsor a Science Day with the Montana Salinity Control Association (MSCA)

ALL PHOTOS Glacier County Conservation District

Jon Siddoway, U.S. Natural Resources Conservation Service, explains setting up a range monitoring plot.

MONTANA RANGELAND MONITORING

Glacier County Conservation District

406-873-5752

Range monitoring is becoming a condition of many grazing permits and leases on both public and private land, regardless of ownership. Past inconsistencies in monitoring methods and terms used among various governmental agencies have been a frustration faced by range livestock producers. Two workshops were created to promote uniformity and consistency in (1) methods used to measure the effects of livestock grazing on rangeland, and (2) evaluation of range condition. The workshops were offered by Glacier County Conservation District to 90 ranchers in June and October of 1999.

Range livestock producers identify grasses.

Each one-day workshop was sponsored by Blackfeet, Glacier County, and Pondera County Conservation Districts. Montana State University Extension Range Specialist Jeff Mosley, Glacier Extension Agent Darren Crawford, and Blackfeet Extension Agent Verna Billedeaux led the discussions. The U.S. Natural Resource Conservation Service assisted individuals in identifying plants, setting up monitoring plots, and keeping records.

ALL PHOTOS: Glacier County Conservation District

PHOTOS: (left center) Darren Crawford and Jeff Mosley present information to producers and assist with checking (far left, right center, and far right) vegetation on a riparian area at John Shepard's.

Shell the wheat

Grind the flour

OODLES OF NOODLES

Glacier County Conservation District

406-873-5752

FROM THE FIELD TO THE TABLE

The Oodles of Noodles Program begins with stations set up for teaching various yet simple tasks taking students, parents, and teachers from grain in the field to pasta on the table.

Station One
A head of wheat is taken apart and examined, showing how the wheat berries grow. The parts of the wheat kernel are explained, with information added about nutrition and production of grain.

Station Two
The wheat berries are ground into flour, using a home flour grinder. The texture of the flour can be felt by rubbing it between the fingers

Station Three
The dough is mixed, following a simple, basic noodle recipe. Chocolate milk mix is added to make the taste of the noodles more appealing to fourth graders.

Station Four
Students roll the dough through pasta machines to make noodles. The students can then taste or take home what they have produced.

Each student has hands-on activity at each station experiencing the development of a product from the field to the table.

Glacier County Conservation District teams with Women in Farm Economics to present a program to fourth grade students as part of the observation of National Agriculture Week.

Many students are unfamiliar with grain products that are specifically grown for pasta. The process of grinding grain for flour and the fun of mixing dough and rolling noodles are shared through this program with teachers, parents, and pupils.

Fourth graders roll out the dough and make noodles using a pasta machine.

Chocolate milk was added to the pasta dough to enhance the flavor for demonstration purposes.

Greg Kutchak, with a handful of plants, explains spring variety plots.

Mark Suta, in the brown shirt, tells his experiences with hard white wheat production

CONSERVATION TILLAGE

A crops tour of new grain variety plots is hosted each year by Glacier County Conservation District. Chemical applications are checked, and spring grain and fertilizer tests are inspected

SPRING CROPS TOUR 1999

Glacier County Conservation District

406-873-5752

Hard white spring wheat had varying results with chemical applications. *Discover*, a chemical presently being used in Canada, is labeled for release in the U.S. in February 2000. There is a wider window of application, especially on the wild oats and Persian darnel, making it easier to receive a high proportion of overall control.

General Mills elevator had two new hollow-stem varieties of hard white spring wheat nearby. Comparisons showed definite differences in growth. Yield on the hard white averages 10 bushels higher than hard red spring wheat with a premium payment.

Utopia durum wheat — a black-bearded variety — provided an eye-catching color comparison with a neighboring field of Ramho. Utopia is a new variety release owned by General Mills.

The Western Triangle Experiment Station's spring grain and fertilizer test plots on no-till or chemical-fallowed farming areas were visited, and the new malt barley varieties were noted. Fertilizer application results were checked on barley seeded to summer-fallowed ground. Local producers grow many solid-stem grain varieties that are sawfly-resistant since sawfly is prevalent in this area.

Root rot has a tendency to show up in dry years, when the plants are under stress due to lack of moisture and aren't healthy enough to resist the rot.

Spring grains at Bruce Bradley's 1999

Barley plots at Bradley's 1999

Black-bearded durum, General Mills, Utopia new variety at Ted Suta's.

ALL PHOTOS: Glacier County Conservation District

Roger Czeck, General Mills, tells of characteristics and proposed improvements in the hard white spring wheats.

Governor Marc Racicot presented the Sage Creek Watershed Alliance with the *2000 Watershed Stewardship Award.* The award is supported by both Hill County (HCCD) and Liberty County (LCCD) Conservation Districts.

The alliance, through HCCD and LCCD, was honored for the following achievements:

- diverse, local involvement
- effective collaboration
- community outreach and education
- comprehensive approach to watershed health

2000 Watershed Stewardship Award

Hill County Conservation District 406-265-6792

Sage Creek Watershed Alliance Chairman, Tom Jurenka, receiving the award from Governor Marc Racicot

Governor Marc Racicot and Marc Ellen Wolfe, chair of the Montana Watershed Coordination Council

Montana State Capitol Building - Helena, Montana

The Sage Creek Watershed Alliance has proven itself to be an effective force through a person-to-person approach in its efforts to address water quality/quantity concerns—primarily, the reclamation of saline seeps and the evaluation of the surface water and groundwater interaction.

The Montana Watershed Coordination Council established the award to recognize innovative, locally led approaches to restoring and enhancing Montana's watersheds.

The delegation representing the Sage Creek Alliance (from the left): Joe Waldner, farm manager of Sage Creek Colony, Tom Jurenka, alliance chair, Mike Wendland, chair, Hill County Conservation District (all board members of the alliance), Marc Ellen Wolfe, Pam Gaubb, administrator, HCCD, Marlene Moon, administrator LCCD, Governor Marc Racicot, John Wurtz, vice president, David Hofer, president and Paul Waldner, secretary/treasurer (Sage Creek Colony officers

CANYON CREEK RESTORATION PROJECT

This project was successfully completed after carefully evaluating and surveying the area, designing a good restoration plan, coordinating with a great number of partners to secure materials and funding, and hiring a competent contractor.

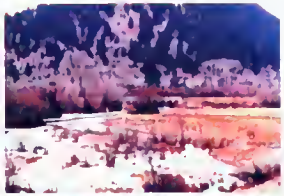
Lewis and Clark Conservation District

406-449-5278

Before construction

Before construction—note the split channel and how it widens the total area under the bridge.

After construction—note that the willow has been removed and placed on the side of the channel. Note also how the channel is no longer endangering the bridge.



Braided channel below the bridge

The problem—The Canyon Creek system has endured a variety of unhealthy activities over the past 100 or more years. Historical hydraulic mining, stream manipulation, historical use of the riparian area by livestock, and building of the highway bridge have all combined to result in large volumes of bedload material coming down the stream, loss of portions of the riparian community, and restriction of the flood-plain. The deposition was sufficient to have severely restricted the conveyance area of the county bridge. Immediately below the bridge, the deposition had completely filled the historical channels, resulting in an extremely braided channel configuration. This sytem was not healthy, and the fisheries habitat was poor.

The solution—The Grady Ranch, along with various other federal, state, county, and local agencies, developed a stream and riparian restoration plan that included modifications within the stream corridor to improve function and riparian and fisheries habitat. The improvements included changes in grazing management of the stream corridor, along with channel adjustments under the bridge to improve conveyance. *Or, more specifically:*

- *The channel above the bridge needed to be narrowed and stabilized with vegetation.*
- *The channel approaching and under the bridge would need to be centered, with side spans acting as the primary floodplain.*
- *Below the bridge, a new channel would have to be excavated.*
- *Channel stability and the riparian plant community would have to be re-established.*
- *The entire project area would have to be excluded from livestock grazing for three years to allow the vegetation to become established.*

Cooperators—

Grady Ranch Company

Lewis and Clark Conservation District

Lewis and Clark County—Road and Bridge

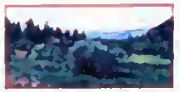
Montana Department of Fish, Wildlife and Parks—
Future Fisheries Improvement Program

US Fish and Wildlife Service—
Partners For Fish and Wildlife Program

Natural Resources Conservation Service

Old braided channel that was filled in

After construction at high water



After high water

SUN RIVER WATERSHED TOUR

On April 21, 2000, Lewis and Clark Conservation District co-hosted a watershed tour, along with Teton County Conservation District, Cascade County Conservation District, and the Sun River Watershed Group.

Lewis and Clark Conservation District

406-449-5278

Showcasing the work that the Sun River Watershed Group has spearheaded in the past five years, the tour participants made four stops in the three conservation districts.

The Lewis and Clark Conservation District stop was at landowner Fred Scherrer's property. Fred and his wife, Phyllis, have participated in a large section of work completed on their property since 1996. Lewis and Clark Conservation District, the US Fish and Wildlife Service; the Montana Department of Fish, Wildlife and Parks; and other agencies cooperated with the landowners to accomplish stream restoration efforts on Elk Creek. The most recent work was finished less than a year ago.

This restoration project started the way many do, with the landowner, Fred Scherrer, approaching Lewis and Clark Conservation District for a 310 permit to repair an eroding streambank in the late fall of 1994. After the proposed project site was reviewed, it was determined that, in addition to the eroding streambank, there were contributing problems upstream with an irrigation diversion system. Additional inventory in 1995 indicated that a solution to the erosion problems would be to install a diversion control structure as well as re-establish a proper meander pattern in this stream reach.

Restoration projects can be quite expensive. Consequently, during the summer and fall of 1995, partnerships were formed with entities interested in assisting financially and/or technically with this worthwhile project. In addition to Fred and Phyllis Scherrer and Lewis and Clark Conservation District, these partners included the US Fish and Wildlife Service; Montana Department of Fish, Wildlife and Parks; Last Chance Audubon Society; Missouri River Flyfishers; and the U.S. Natural Resources Conservation Service.

The initial construction phase of the project started in the late fall of 1995 and was completed in the spring of 1996. Approximately 1,000 feet of streambank was restored during this phase of the project. A fish-friendly irrigation diversion was constructed using local rock and a screw-gate water control structure to eliminate the need for annual damming of the river. Re-vegetation was accomplished using local sod transplants along the streambanks and seeding a native grass mix in other disturbed areas.

Additional impaired reaches of the river were identified with ongoing evaluation and monitoring of the site. Construction to rehabilitate an additional 2,100 feet of stream was just completed during the fall of 1999. Local material was used to reshape and realign the stream channel into a more stable pattern and profile, which will equate to a healthier stream system.

Fencing to enable better control of grazing animals has also been installed.

Over one mile of Elk Creek has now been enhanced as it flows through the Scherrer property, which will directly benefit adjacent landowners, fisheries, and local wildlife.

Lewis and Clark Conservation District, Cascade County Conservation District, Teton Conservation District, and the Sun River Watershed Group

Governor Marc Racicot presented the Sage Creek Watershed Alliance with the *2000 Watershed Stewardship Award*. The award is supported by both Hill County (HCCD) and Liberty County (LCCD) Conservation Districts.

The alliance, through HCCD and LCCD, was honored for the following achievements:

- diverse, local involvement
- effective collaboration
- community outreach and education
- comprehensive approach to watershed health

2000 Watershed Stewardship Award

Liberty County Conservation District 406-759-5778

Sage Creek Watershed Alliance Chairman Tom Jurenka, receiving the award from Governor Marc Racicot

Governor Marc Racicot and Mary Ellen Wolfe, chair of the Montana Watershed Coordination Council

Montana State Capitol Building - Helena, Montana

The Sage Creek Watershed Alliance has proven itself to be an effective force through a person-to-person approach in its efforts to address water quality/quantity concerns—primarily, the reclamation of saline seeps and the evaluation of the surface water and groundwater interaction.

The Montana Watershed Coordination Council established the award to recognize innovative, locally led approaches to restoring and enhancing Montana's watersheds.

The delegation representing the Sage Creek Alliance (from the left): Joe Waldner, farm manager of Sage Creek Colony, Tom Jurenka, alliance chair, Mike Wendland chair, Hill County Conservation District (all board members of the alliance); Mary Ellen Wolfe, Pam Gubb, administrative HCCD, Marlene Moon, administrator LCCD, Governor Marc Racicot; John Wurtz, vice president, David Hofer, president; and Paul Waldner, secretary/treasurer (Sage Creek Colony officers)

Lower Musselshell Conservation District covers a wide range of activities—ranging from studying the tiniest macroinvertebrate in Careless Creek to using the latest water conservation technology available.

Lower Musselshell Conservation District

406-323-2103

ANNUAL OUTDOOR CLASSROOM

At the Annual Outdoor Classroom on Careless Creek, students participated in their own area of interest, ranging from catching fish by electricity to catching bugs by net.

WEATHER STATION

Lower Musselshell Conservation District recently co-sponsored the installation of a weather station that

- *calculates evapotranspiration rates for crops grown in the area*
- *calculates crop water-use information related to stages of crop growth.*

Producers attended district-sponsored workshops to learn how to use this tool to make informed management decisions, irrigate efficiently, and protect natural resources.

Fort Logan Bridge hydrant located along Highway 360, northwest part of the county.

Checkerboard hydrant located on Highway 12, heading toward Billings.

Ranch Creek hydrant located along Highway 89 in Great Falls, northern part of the county.

DRY HYDRANT FIRE PROTECTION PROJECT

Meagher County Conservation District

406-547-3633

Bair County hydrant at the Bair Museum near Martinsdale.

Meagher County Conservation District and the U.S. Natural Resources Conservation Service cooperated with the White Sulphur Springs Volunteer and Meagher County Rural Fire Departments to install 13 dry hydrants around the county. A grant, administered by Beartooth Resources Conservation and Development, cost-shared the installation, up to $500 each applicant.

Meagher County has already benefited from the use of the new hydrants for fire protection.

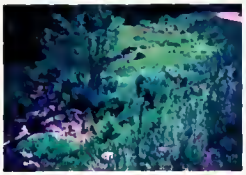
Dry hydrants provide a dependable, 365-days-per-year source of water to assist with fire control efforts.

ALL PHOTOS: Meagher County Conservation District

Fire protection in Meagher County is greatly enhanced by the new dry hydrants.

Knapweed Nelly Program

This successful program teaches children (K-3rd grade) about noxious weeds and how they can help prevent their spread. Children participate in a discussion on knapweed, watch a video, and do activity sheets related to the topic. This program was taught to 24 classrooms approximately 475 students and 24 teachers



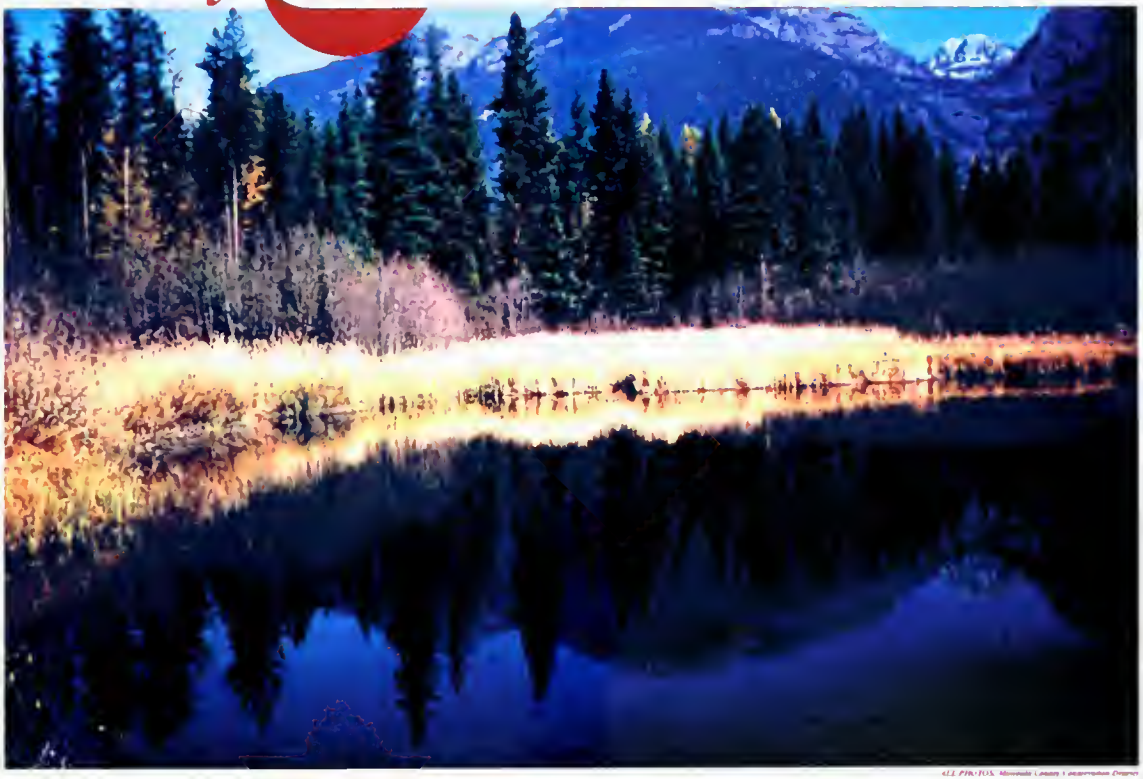
Riparian Forest Buffers

Missoula County Conservation District is actively working with landowners around the county on installation of riparian forest buffers for streambank stabilization, fisheries, and wildlife habitat improvement. We have had good success with installation of native willow cuttings gathered on-site. This stream corridor was fenced and sprigged with Druommond willow cuttings

Missoula County Conservation District

406-251-4826

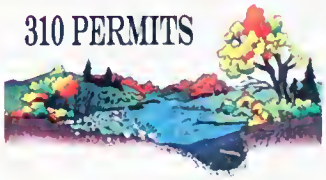
Cost-share participant and daughters, Swan Valley.



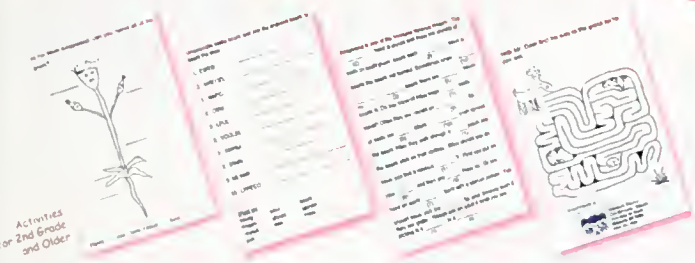
ALL PHOTOS: Missoula County Conservation District

Pilot District Cost-Share Program A Great Success

Missoula County Conservation District received 42 applications for its new cost-share program, and 19 projects were partially or fully funded. Applications came from all over Missoula County. The conservation district hopes to continue this program for a five-year period. The pilot district cost-share program included the following practices: bridge replacement, fisheries enhancements, diversions, irrigation water conveyances, riparian forest buffers, stream stabilization, wetland restoration, filter strip grassed waterways, vegetative plantings, windbreaks, forest site preparation, forest stand improvements, spring developments, weed control, fencing, native plant restoration and improvement, wildlife habitat improvement, and tree/shrub planting.



Missoula County Conservation District has developed a new brochure to help educate landowners and 310 applicants on the 310 law and permitting process



Hi, everyone!
I'm Knapweed Nelly, and
I am spotted knapweed.
Here's how I spread, and here's how you can help to stop the spread of weeds.

Missoula County Conservation District

406-251-4826

Knapweed Ned and Nelly Program

Knapweed Ned and Nelly is a program for K-3rd Grade that teaches children about noxious weeds and how they can help prevent their spread. Children participate in a discussion on knapweed, watch a video, and do activity sheets related to the topic. This program was taught to 24 classrooms approximately 475 students and 24 teachers.

The attention span of children varies, and materials are developed to address each age group. The program consists of an information discussion with students and a knapweed plant to illustrate plant growth habits. Students learn where knapweed comes from, how it got here, how it spreads, and ways to help prevent its spread.

Students learn why area residents don't want knapweed on their property.

- *Knapweed Nelly puppets and a presenter in a knapweed costume get the program started.*
- *Activities are geared for specific age groups.*
- *A video from the Wyoming Weed and Pest Council is shown, with activities following that reinforce the messages.*
- *At the end of the program, each student receives a coloring book with information about further resources for parents.*

Children are questioned about their knowledge of weeds throughout the program. An important part of the teaching is a display of different types of insects that feed on knapweed seeds and roots. The students watch a video entitled *A Kid's Journey to Understanding Weeds*. The video is sponsored by the Wyoming Weed and Pest Council. The video includes fourth graders telling other children about diffuse knapweed and musk thistle and how they can help be "Weed Warriors." A short question-and-answer session asking "What did you learn?" follows the video. Activities reinforce the program message. The program ends with distribution of a coloring book entitled *Ned and Nellie Present the Knapweed Coloring Book*. Additional resources for parents are listed in the coloring book.

Park Conservation District 406-222-2899

GOVERNOR'S UPPER YELLOWSTONE RIVER TASK FORCE

Governor Marc Racicot created the Upper Yellowstone River Task Force in November 1997 to address problems arising from the extreme floods of 1996 and 1997.

PURPOSES:

- Provide a forum for the discussion of issues that affect the upper Yellowstone River basin.
- Bring together landowners, sportsmen and sportswomen, and community leaders.
- Ensure that future projects affecting the river are planned and conducted in a manner that will preserve the integrity, beauty, values, and function of the upper Yellowstone River for Montanans now and in the future.

OVERALL GOAL:

- Develop a set of publicly supported river corridor management recommendations that address potential adverse cumulative effects of river channel modification and floodplain development on the human community and the riparian ecosystem.

Upper Yellowstone River Study Area: Gardiner to Springdale, Montana; 2,930 square-mile basin.

OFF-STREAM STOCKWATER AND HABITAT/RIPARIAN PROTECTION PROJECT

Installed three frost-free tanks in the upland area in order to provide another source of water for approximately 600 cows that had been drinking from Daisy Dean Creek.

Installed tank

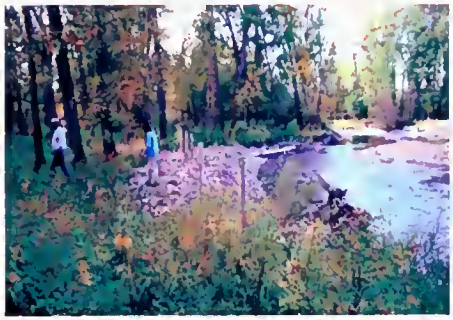
Degraded riparian area (north side of the county road)

Degraded riparian area (south side of the county road)

UPPER SHIELDS RIVER WATERSHED ASSOCIATION

Park Conservation District

406-222-2899



Before

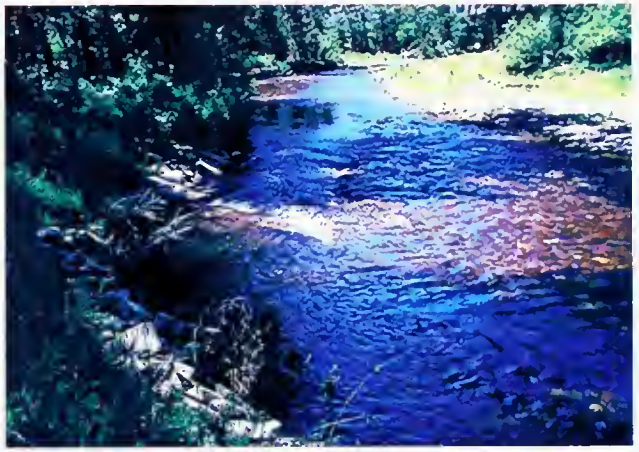
HOYEM BROTHERS BANK STABILIZATION PROJECT

Stabilized 191 feet of the Shields River using barbs and rootwads.

The Upper Shields River Watershed Association is a collection of land owners and citizens of the community who share the vision that ranching, as a way of life, can and must be preserved. This group has been drawn together for the purpose of protecting and improving the land, water, and the resources of the land since these represent the very foundation of ranching.

The association works collaboratively with federal, state, and local government agencies on projects intended to protect and improve watershed health throughout the upper Shields River area. The Association has been active since November 1997.

The size of the upper Shields watershed is 543 square miles and 347,520 acres.



After (summer with vegetation growth)

After (winter)

Irrigators from Blaine County attend an irrigation workshop to learn the art of texturing soils from U. S. Natural Resources Conservation Service Soil Scientist Rick Bandy

Phillips Conservation District Field Technician Deb Pankratz is standing in front of an AgriMet weather station

IRRIGATION WATER MANAGEMENT PROGRAM

Phillips Conservation District

406-654-1334

Phillips Conservation District Field Technician Deb Pankratz (left) works with Art Matter from Turner, Montana. They are testing moisture using the feel-and-appearance method utilizing a Paul Brow Probe

Saco producer Craig Burnham (left) uses weekly crop water reports and soils information to schedule irrigation on his corn fields

Irrigation scheduling using AgriMet ET data can provide significant savings in water, pumping costs, and fertilizer, herbicide, and pesticide applications.

Everyone benefits from reduced soil erosion and protection of surface water and groundwater quality.

The U. S. Bureau of Reclamation, in cooperation with other federal, state, and local sponsors, has developed an agricultural weather information system called "AgriMet" to promote energy and water conservation. AgriMet is a contraction of the words *Agriculture* and *Meteorology*. It is a network of automated weather stations that collect and telemeter site-specific weather data. AgriMet's primary purpose is modeling ET (*evapotranspiration*—the amount of water used/emitted by a crop)

The educational focus of the AgriMet Irrigation Water Management (IWM) Program is to provide irrigators with information about a management tool for developing IWM plans. Benefits from practicing IWM are directly related to applying the right amount of water according to crop state, weather, and soil water-holding capacity. The program is available to cover approximately 120,000 acres of irrigated ground in the Milk River basin, throughout Phillips, Blaine County, and Valley County Conservation Districts

Valley County producer Bob Norman (left), with Valley County Supervisor Dick Rohde—standing on a freshly cut alfalfa field

Dick Meier, a Conrad Junior High teacher, brought his archeology collection. Students learned how an arrowhead is made.

Bill Hill of the Department of Fish Wildlife and Parks brought pictures of fish for students to identify

Phyllis Philipps of the U S Natural Resources Conservation Service and her mother, Josephine Caputo, visiting from California, taught students about ecosystems and illustrated how each one of us is part of that system Students participated in charades including frogs, deer, and insects while forming a web of yarn woven from student to student. As portions of the web were cut away, students learned how ecosystems are destroyed as portions of the interconnected web are weakened

Rick Bandy and Ber Walker, NRCS, taught kids about soil. The different types of soil are sand, silt, and clay. A mixture of these make up soil. Bandy showed how to determine soil texture by wetting a sample of soil and making a ribbon. Each student took a sample of soil and added water to check the soil's smoothness and gritiness.

Rick Bandy, NRCS, showed students different soil textures.

Lanny Walker, NRCS, explained the differences between forbs, grasses, and shrubs. Stephane Rittman, Pondera County Extension Agent, talked with students about annuals and perennials. Annuals run their course and die out, while perennials die back in the fall and then store their energy in their roots for the coming spring. At the end of the session, students could identify the difference between annuals and perennials, and between forbs, grasses, and shrubs.

Pondera County Conservation District

406-278-3922

4th GRADE OUTDOOR CLASSROOM

Over 125 students from Pondera County attended the 4th Grade Outdoor Classroom. Six 20-minute stations were set up near the creek to teach the children about soils, plants, animals, and fish.

At the archeology station, Dick Meier, a Conrad Junior High teacher, shared his collection of Indian artifacts. Dick demonstrated how Indians made arrowheads by taking a basalt rock and breaking off pieces with a chunk of deer antler until it was razor sharp Differently sized arrowheads had different uses, and differently shaped rocks were used for different purposes, like the thumbnail rock for cleaning animal hides

Bill Hill of the Montana Department of Fish, Wildlife and Parks (DFWP) gave the students a book with pictures of different fish and asked them to identify plastic fish Students compared color, fins, and spots and looked up where the fish are found Students learned that fish are predators if they eat other fish

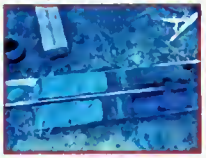
Students ended the day with a scavenger hunt applying their new knowledge. Students collected litter and illustrated being good land stewards. Lilac trees and a treat bag were handed out. Pondera County Conservation District thanks the participating schools, teachers, and chaperones, NRCS, DFWP, MSU Extension Service, Dick Meier, Fred Walker, Lanny Walker, and Connie Hanson for organizing the classroom and John and Leanne Haynes for use of their land and the access gate.

We had a great turnout See you all next year!

Gary Olson, DFWP biologist, explained the differences between horns and antlers. Horns are made from bone, just like a person's fingernails, and they do not fall off each year. Antlers, on the other hand, fall off and regrow each year. Of all the antlered animals, only males have antlers. Horned animals can be male or female and keep their horns for life. Ruffalo and bighorn sheep make good examples. Other animals find nutrients and vitamins in the antlers that are shed each year. Antlers do not give an accurate indication of an animal's age. Age is determined by examination in a laboratory of the animal's teeth and its growth rings.

Core drilling

Removing core samples



Core sample

Core samples stored for lab analysis

Computer water-level-data recorder

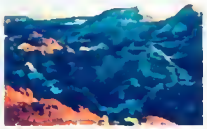
The permeameter is used to measure the rate at which water infiltrates the soils at the land surface

Collecting water samples from monitoring wells near Cherry Creek

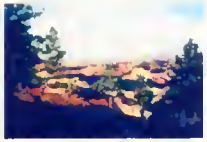
Prairie County Conservation District

406-635-5381

ESTIMATING RECHARGE TO GROUNDWATER IN EASTERN MONTANA—CHERRY CREEK DRAINAGE

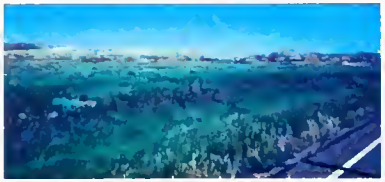


Terry Badlands looking northeast out across the Yellowstone River valley



Terry Badlands in the Tertiary Fort Union Formation looking north

Prairie County Conservation District and James Rose of the Montana Bureau of Mines and Geology entered into a joint study for determining infiltration recharge contributions to the groundwater of the upper Fort Union Formation in eastern Montana. Results from the Cherry Creek study site near Terry can be applied to groundwater in a large segment of eastern Montana. The primary purpose of this study is to provide information to help the public and private sectors make decisions on how to manage, protect, and develop the area's groundwater resources.



Lebo Member of the Fort Union Formation with a few thin coal beds

Landscape of the lower Cherry Creek drainage.

This information will be useful in answering questions, such as:

- *If I drill a new well, how deep will I have to go? Will the water be suitable for drinking?*
- *Is there any chance of using groundwater as a new public water supply?*
- *What are the current water levels in deep wells?*
- *Is an aquifer's recharge-zone water quality changing?*
- *Is land use affecting water quality in shallow aquifers?*
- *Are shallow wells failing due to drought?*
- *Is increased use of groundwater causing water levels to decline?*

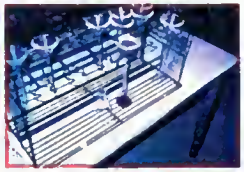
METHOD OF STUDY. Core samples were collected at four sites in the Cherry Creek drainage. The cores were collected using an auger drill and continuous core sampler in 2-foot intervals to 40 feet (about the level of the water table). The samples were broken into 1-foot intervals, stored in jars, and transported to the Montana Bureau of Mines and Geology lab in Butte. At the lab a portion of the sample was mixed with deionized water and stirred for eight hours to dissolve any chloride in the soil into the water. The water was decanted into flasks. Silver nitrate was titrated into the decant water until potassium chromate was formed, causing a color change to yellow. The amount of silver nitrate required was used to determine the amount of chloride present in the sample. The amount of chloride present was used to estimate the amount of water from precipitation that has infiltrated through the vadose zone to the water table.

PERMEAMETER. A permeameter was used to measure the rate of water infiltration through the land surface and the upper few centimeters of soil. A tube at the base of the permeameter is placed on the ground surface or a few centimeters below the surface. The upper tube is filled with water. As water in the upper tube drains through the lower tube and into the ground, the rate of drainage is recorded at 1-minute intervals. The results are graphed, and the rate of water infiltration can be calculated from the data.

DATA RECORDER. The data recorder records the water level in the monitor well every hour year-round. The data are downloaded and stored in the Montana Bureau of Mines and Geology database.

Collecting water samples from a pump jack and windmill.

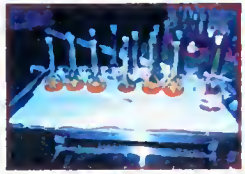
All photos are courtesy of James Rose



Decanting water, draining sample through filter paper

Lab setup showing flasks of decant water and shaker table for mixing water and core samples.

Water samples ready for titration



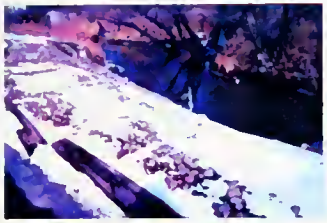
Water samples after titration showing color change indicating saturation of solution and chloride concentration

Shelterbelt with mesh on farmstead

Encouraging proper natural resource conservation in order to preserve the productivity of the land for future generations

Richland County Conservation District

406-433-2103



Stream bank stabilization, Lone Tree Creek

Irrigation pivot on wheat

Montana Department of Natural Resources and Conservation Range Loan. Stockwater pipeline

Richland County Conservation District purchased a Lawson aerator this past year. The aerator was purchased with local funds and 223 grant funds to aid producers in rejuvenating rangeland and pastureland. We also plan to use it in Conservation Reserve Program maintenance. A local landowner used it to re-seed pastureland with more productive grass without disturbing the seedbed. Neighboring counties have used the aerator, and we are anxiously awaiting reports on results of the demonstrations. Results need to be tracked on a season-by-season basis.

Aerator on pasture—June 1999

Tree crew planting trees—2000

Aerator—June 1999

Blue spruce planted spring 2000—mesh laid to control weeds

Richland County lies in the eastern part of Montana, with a land area of about 1,321,600 acres. Forty percent of the county is cropland and pasture, and 54 percent is rangeland. The principal crops are wheat, sugar beets, hay, barley, oats, and corn for silage. Beef cattle and small grain production are the main enterprises. The Yellowstone and Missouri Rivers support the irrigated acres in the county.

Thirty producers work actively with the Montana Department of Fish, Wildlife and Parks to promote upland game bird habitat on 100,000 acres in the county. Planting trees that benefit wildlife is one of the ways to increase bird populations. Our tree crew has been very busy this season with over 50,000 trees planted and 40 miles of weed-barrier fabric laid. The use of mesh to control weeds is becoming a very common practice. We use a fabric that allows the moisture to permeate into the soil, but doesn't allow the weeds to grow.

The Richland County Conservation District Board of Supervisors has approved six 310 applications for the current year. These applications include pump site maintenance on the Missouri, major restoration work at the MDU plant on the Yellowstone, and stream bank stabilization on listed streams.

Richland County has the unique situation of having reserved water available to producers on both the Yellowstone and Missouri Rivers. Irrigated acres using reserved water on the Missouri have been steadily increasing in recent years.

SIXTH GRADE CONSERVATION DAYS ANNUAL SPRING EVENT

Rosebud Conservation District

406-356-7479

Rosebud Conservation District (RCD) hosts Sixth Grade Conservation Days each spring. The event is held during three consecutive days. Students attend from Lame Deer, St. Labre, Ashland, Colstrip, Rosebud, Forsyth, and Hysham. The district observed that some students have little knowledge of agriculture and the natural resources around them. Sponsored cooperatively by RCD and Treasure County Conservation District, this event helps work toward a common goal of providing conservation education to youth.

Throughout the day, students in groups are rotated through six learning stations: Trees, Range, Surveying, Wildlife, Soils, and Water Quality. Each station provides hands-on learning activities for students. Past activities include teaching students how to determine the direction of water flow across land by using surveying instruments, and how to determine water quality by looking at findings.

Instructors volunteer from the following agencies: U.S. Natural Resources Conservation Service, Extension Service, Montana Department of Natural Resources and Conservation, Montana Department of Fish, Wildlife and Parks, and U.S. Forest Service. These instructors willingly give their time and knowledge. Their help is very much appreciated. Access is generously provided to this outdoor event by local landowners.

PHOTOS: ROSEBUD CONSERVATION DISTRICT

ESP/Chambers before

Winter 1999—ESP/Chambers construction

ESP/CHAMBERS SPRING CREEK PROJECT

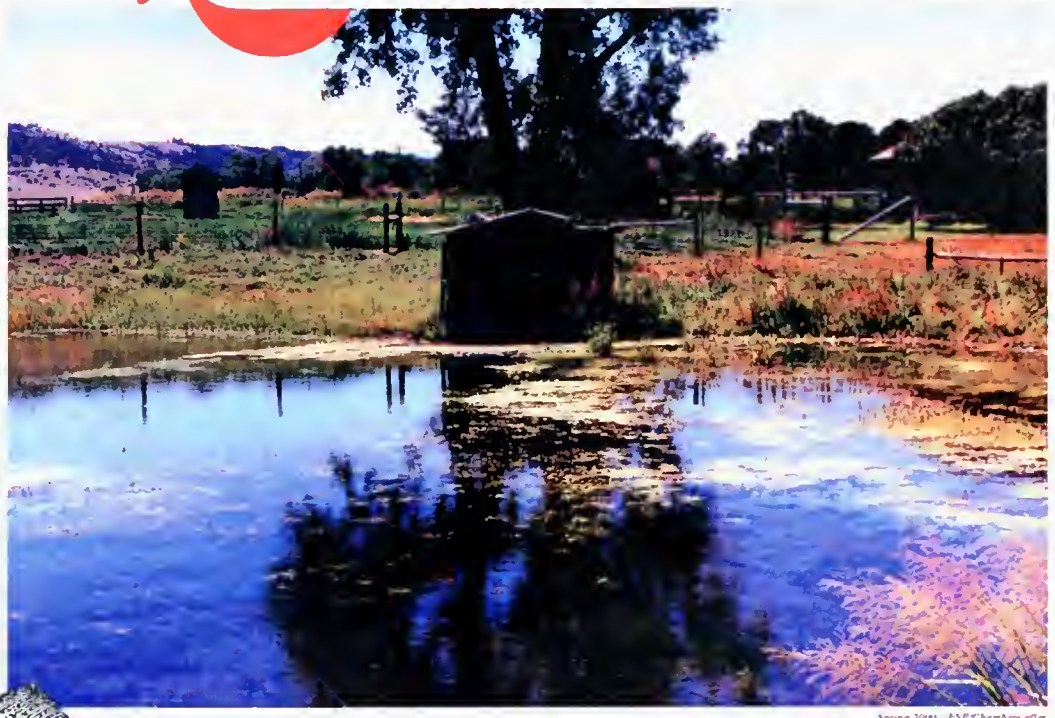
Sweet Grass County Conservation District

406-932-5160

The restoration of ESP/Chambers Spring Creek included cleaning up a livestock pond and a small, spring-fed stream flowing into the Yellowstone River. The spring creek was reconstructed, vegetation was planted, and livestock were fenced off the spring creek. A grazing plan was implemented to protect riparian vegetation and habitat.

At right: ESP/Chambers stream before

Below: ESP/Chambers stream after



Spring 2001—ESP/Chambers after

The ESP/Chambers Spring Creek Restoration Project is a cooperative effort between two landowners, the U.S. Natural Resources Conservation Service, U.S. Fish and Wildlife Service, and Montana Department of Fish, Wildlife and Parks.

Sweet Grass County Conservation District sponsored the project, provided technical assistance, and served as funding administrator.

The primary goal of the project is to increase the Yellowstone River cutthroat trout population by providing a safe spawning ground. Instream incubation has been implemented during two previous years with good results. Instream incubation will continue for two additional years.

Teton County Extension Agent Dan Clark welcomes students and creates some excitement for the day ahead.

Students, teachers, and student FFA leaders pose for a "Goodbye and Thank You" picture!

Patty Johnston of the U.S. Forest Service explains different parts of the trees in a riparian area during her segment on plants.

Teton County Conservation District

406-466-5722

Fourth graders from around Teton County dig for dinosaur bones and learn grid mapping

FIRST ANNUAL
CREEKS AND CRITTERS OUTDOOR CLASSROOM

Rick Bandy of NRCS teaches about different soil types in a riparian area. Hands-on. Lots of muddy fun!

Bill Hill of the Montana Department of Fish, Wildlife and Parks holds kids' interest with lots of different types of fish that he caught right there in Spring Creek!

The First Annual Creeks and Critters Outdoor Classroom was held on May 18, 2000, along Spring Creek in the Choteau City Park. One hundred and thirty-five grade-school students from eight schools around the county came to spend the beautiful spring day learning about how riparian health affects soil, water, geology, wildlife, aquatic life, and plant life. Presenters used hands-on activities as children learned rudimentary ecological concepts.

Funding for the daylong program was through an HB 223 mini-grant from the Montana Department of Natural Resources and Conservation through the Teton County Conservation District.

Others who presented and assisted include Lisa Flowers with Boone and Crockett, Patty Johnston with the U.S. Forest Service, Cari Ostberg and Rick Bandy of the Natural Resources Conservation Service (NRCS), Paul Belanger of The Nature Conservancy, Alan Rollo from the Teton River Watershed Group, Bill Hill and Quentin Kujala of the Montana Department of Fish, Wildlife and Parks, Becca Hanna of the Old Trail Museum, and Dan Clark, Teton County Extension Agent.

Five FFA students from Fairfield High School and four FFA students from Choteau High School attended the outdoor classroom to assist with smoothly moving the groups between stations. Resource kits were given to the teachers at the end of the program. The kids were also given large trash bags and encouraged to pick up garbage along the creek as they passed from station to station.

Students built their own habitats and visited the horned lizard and the Russian tortoise.

The Ag Day Presentation is always a great success. Third and fourth grade students from Sunburst, along with home-schooled and Colony School students, spend a day studying natural resources and conservation. The same program is then presented to third graders at the Meadowlark School in Shelby. This year's theme was "Habitat," and the activities involved learning from Rod Duty, the game warden, how different animals live and how to respect them. Students built their own habitats with dirt, worms, and plant seeds. Students also made habitats from edible materials. Stations were set up for students to see the horned lizard (horny toad), Russian tortoise, bugs in bottles, a baby lamb, and to go on a horse-drawn hay ride. The hands-on activities keep the kids interested, engaged, and learning.

Toole County Conservation District

406-434-5234

EDUCATION FOR ALL AGES

The Toole County Conservation District has identified education as a priority issue. In keeping with our goal to promote resource conservation education, the district sponsored several educational events that served young and old.

LUNCH BOX SERIES

For the young at heart, a Lunch Box Series was presented again this year. In conjunction with the Toole County Extension Agency, we offered 1-hour presentations during the lunch hour for three days. The district provided meals, and each person was presented with a talk on the Conservation Reserve Program (CRP) with Misty Vermulm, U.S. Natural Resources Conservation Service, and Bob Hermance, U.S. Farm Service Agency; saline seep with Jane Holzer, Salinity Control; and leafy spurge competition with experimental grass plantings that were planted by Chris Onstad, the county's Extension Agent.

Jane Holzer from Salinity Control presented a workshop on saline seep during the Lunch Box Series.

A field trip to see experimental grass plantings was presented by Chris Onstad, County Extension Agent, during a Lunch Box session.

The "nose pump project" was developed on the Olson Brothers Ranch, north of Twodot.

COWS MOOOOVE TO A NEW WATERING SYSTEM

Upper Musselshell Conservation District

406-632-5534

The Pump. The Aquamat is a diaphragm pump with a pumping lever that is pushed by the nose of an animal. One pump is recommended for every 20 head of cattle. The elongated drinking bowl has a slight slope to the back, away from the animal. The pump lever must be operated until the water is drawn up into the bowl for the first setup. The water in the back of the drinking bowl acts as bait, attracting the animal to push the lever out of its way to reach the water. Each time the lever is pushed, a pump stroke brings more water into the bowl. The lever is released to make a back stroke when the animal pulls its head away. The back stroke action draws more water into the bowl as the lever returns to its initial position. Water always remains in the bowl, attracting the next animal. Animals quickly learn that pushing the lever three or four times fills the bowl with water. The pumps are connected to a water source through a one-inch suction hose and a spring-loaded foot valve with a screen that meets fisheries requirements.

NOSE PUMP PROJECT

The Upper Musselshell Conservation District funded an innovative livestock watering project during 2000 on the Olson Brothers Ranch. The brothers, Rick, John Clay, and Cy, had fenced out a small creek in their pasture and hauled 1,000 gallons of water each day throughout the summer for 45 head of cattle.

The nose pump project included installation of a watering system 200 feet from the creek. The nose pump is designed for cows to sip from their own water fountain.

The Olson brothers no longer haul 1,000 gallons per day. They haul 350 gallons of water every other day. The innovative nose pump watering system makes it possible to conserve both water and fuel costs.

Saline seep—crop production has been eliminated

Photo A

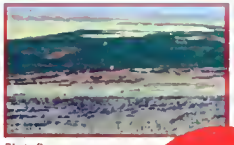


Photo B

Photo A—Saline reclamation project in progress. Alfalfa has been established in the recharge area, and the saline area now supports salt-tolerant vegetation. A monitoring well is used to measure the depth to groundwater.

Photo B—Overview of saline reclamation project.

Monitoring well in a saline seep—saline high water table has eliminated crop growth

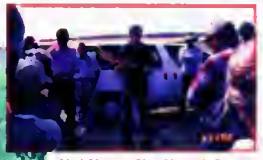
Yellowstone Conservation District

406-247-4420

Regional geology creates unique conditions in the Comanche, Lake, and Hailstone basins. In addition to the saline cropland, some animal health problems are related to the forages produced in this region and the degraded water quality. Local producers are learning to analyze their forages (both hay and pasture) and water sources and then adapt feed rations to compensate for both toxic and deficient levels of trace minerals.

A large crowd attended the field tour held May 23, 2000, to view Lane Properties' successful reclamation project. Resource and animal health specialists summarized the regional geology, reclamation plan development, salt-tolerant vegetation and establishment measures, animal health issues, and U.S. Department of Agriculture programs. Saline seeps can be brought back into crop and forage production when addressed correctly.

Alfalfa established in the recharge area, upslope from the saline area that now supports salt-tolerant vegetation (and formerly was covered with a white-salt crust).



Mark Majerus, Plant Materials Center explaining salt-tolerant vegetation.

Scott Brown, MSCA, describing the saline seep investigation process.

Field Tour of Lane Properties

Lee Lane, landowner describing the reclamation process.

Dr. John Patterson, Montana State University animal scientist, describing antagonistic trace mineral problems in livestock.

Example of white salt crust formed in a saline seep.

SALINE SEEP RECLAMATION PROJECT

Saline soil and water conditions can adversely impact agricultural practices, but they can be improved! Loss of productive cropland to saline conditions led Lee Lane and his family to work on remediation practices near Molt. Starting in 1990, the Lanes began working with Montana Salinity Control Association (MSCA) and Natural Resources Conservation Service (NRCS) to find out what was causing the expanding saline conditions and what could be done to slow the loss or reclaim the land.

MSCA completed a shallow groundwater investigation and developed a long-term reclamation plan. NRCS helped the Lanes with technical and financial assistance to implement the reclamation measures. Land-use changes have been gradually adopted by rotating large recharge areas, which cause the saline discharge or seeps, to perennial forage from the crop-fallow system. The Plant Materials Center provided seed for a salt tolerant vegetation establishment trial.

In addition, the Lanes adopted a no-till intensive cropping system to improve soil conditions and reduce erosion. Concentrating hay production in one area creates a greater impact to the shallow groundwater system and makes the farm more efficient. The conditions have improved significantly and most of the saline land is now in forage production. More forage still needs to be planted, but eventually the recharge acres can be rotated back and forth from hay to grain. The saline areas will remain in perennial vegetation on a permanent basis.